UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/649,583	08/26/2003	Jean-Marie Lehn	GMX-007.02	4996

25181 7590 11/16/2007

FOLEY HOAG, LLP
PATENT GROUP, WORLD TRADE CENTER WEST
155 SEAPORT BLVD
BOSTON, MA 02110

EXAMINER	
BETTON, TIMOTHY E	

ART UNIT	PAPER NUMBER
1614	

MAIL DATE	DELIVERY MODE
11/16/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/649,583	LEHN ET AL.	
	Examiner	Art Unit	
	Timothy E. Betton	1614	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 1 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 6-9 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) _____ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☒ Claim(s) 6-9 are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Requirement for Election/Restriction

Restriction to one of the following inventions is required under 35 U.S.C. 121:

I. Invention I (claims 6 and 7) is drawn to a method of enhancing oxygen delivery to a tissue or organ of a mammal and of improving the oxygen delivering capability of mammalian blood, comprising the step of adding (incorporating IHP), comprising the step of administering to said mammal, red blood cells or whole blood previously treated with a composition, classified in class 514 and subclass 089.00.

II. Invention II (claims 8 and 9) is drawn to method of improving the oxygen delivering capability of mammalian blood, or incorporating IHP into mammalian blood cells, via adding to said mammalian blood a composition represented by structure I, classified in class 514 and subclass 089.00.

The inventions are distinct, one from the other because of the following reasons: Inventions are unrelated if it can be shown that they are not disclosed as capable of use together and they have different designs, modes of operation, and effects (MPEP § 802.01 and § 806.06). In the instant case, instant inventions I and II are distinct by design, operation, and effect. Specifically, invention I administers to a mammalian subject directly (in vivo), whereas invention II administers specifically to red blood cells or blood (ex vivo, in vitro). Invention I teaches a method of enhancing oxygen delivery to a tissue or organ of a mammal. Invention I is patentably distinct from Invention II, which is drawn to method of improving the oxygen delivering capability of mammalian blood, or incorporating IHP into mammalian blood cells, via adding to said mammalian blood a composition represented by structure I. Invention I

and Invention II are both distinct from each other by design, operation, and effect. A method of enhancing oxygen delivery to a tissue or organ of a mammalian subject does not necessarily mean improving the oxygen delivering capability of mammalian blood, or incorporating IHP into mammalian blood cells and/or vice-versa. Accordingly, certain patient populations may be indicated for the limitations of Invention I and not Invention II. Likewise, Invention II contains methods of improving the oxygen delivering capability of mammalian blood that may be treated separately and distinctly from the methods of enhancing oxygen delivery to a tissue or organ of a mammalian subject, drawn to Invention I. Specifically, invention I is drawn to in vivo subject matter and invention II is drawn to in vitro subject matter. In vivo subject matter is distinct from in vitro subject matter via design (construct/properties of device different for in vivo in relation to in vitro), operation (the process of administration), and effect (in vivo, i.e., direct administration, i.e., bioavailability in contrast to in vitro, i.e., assaying, treating blood specimens). Because these two inventions are independent or distinct for the reasons given above, they require a different field of search and they have acquired a separate status in the art because of their recognized divergent subject matter, the requirement for election for examination purposes as indicated is proper.

***Election of Species Requirement for* nC+ component and disease states**

(claims 6- 9) for Inventions I and II

Instant applications disclose claims directed to the following patentably distinct species of **(a)** species of composition represented by structure 1:

nC+ represents (a) nona-cyclohexylammonium-tri-sodium, (b) bis-dicyclohexylammonium-deca- sodium, (c) octa-dicyclohexylammonium, (d) hepta-l-aza-3-hydroxyl-bicyclo[2.2.2]cyclooctanium, (e) dodeca-l-aza-3-hydroxyl-bicyclo[2.2.2]cyclooctanium,(f) nona-piperidinium, (g) penta-H3N-Phe-OMe, (h) nona-H3N-Phe-OMe, (i) hexa- 1-indanylammonium,(j) hepta-2-norbornylammonium, (k) nona- decahydroquinolinium, (l) hepta-H3N-Phe-OEt, (m) hexa-H3N-Phe-OEt, (n) octa-H3N-sec-Leu,Ot-Bu, (o) dodeca-diisopropylammonium, (p) octa-H3N-Pro-Ot-Bu, (q) deca-H3N-Tyr-OEt, (r) tetra-cyclohexyl-l, (s) 2- bis-ammonium, (t) nona-cycloheptylammonium, (u) undeca-cyclopentylammonium, or (v) undeca- cyclohexylammonium, (w) penta-(N,N'dibenzyl)-ethylenediammonium, (x) octa menthyl-1,8- diammonium, (y) penta cyclohexyl-(1,3-bismethylammonium),(z) penta (+)-(1,2-trans-diphenyl)- ethylenediammonium, (aa) nona N-cyclohexyl-piperidinium, (bb) bis (NI,N3-cyclohexyl)- dipropylenetriammonium, (cc) tris tri-(N-cyclohexyl-2-amino-ethyl)-ammonium, (dd) tetra N,N'di-(3-(N- cyclohexyl-amino)-propyl)-piperazinium, (ee) tris tri-(N-cycloheptyl-2-amino-ethyl)-ammonium, (ff) tri N,N'di-(3-(N-cyclooctyl-amino)-propyl)-piperazinium, or (gg) bis N,N',N",N"'-tetrahexyl-cyclam (claim 1), and

(b) a method of treating a mammal afflicted with (a) anemia, (b) coronary infarction, (c) pulmonary disease, (d) congestive heart failure, (e) diabetes, (f) myocardial infarction, (g) stroke, (h) peripheral vascular disease, (i) intermittent claudication, (j) circulatory shock, (k) hemorrhagic shock, (l) chronic hypoxia, (m) altitude sickness, (n) arteriosclerosis, (o) respiratory alkalemia, (p) metabolic alkalosis, (q) sickle cell anemia, (r) reduced lung capacity, (s) gangrene, (t) anaerobic infections, (u) carbon monoxide poisoning, (v)nitric oxide poisoning, or (w)

cyanide poisoning, comprising the step of administering to said mammal red blood cells or whole blood previously treated with a composition of claim 1 and subsequently suitably purified such that when said red blood cells or whole blood is administered to said mammal it is nontoxic (claim 3).

The species are independent and distinct in instant claim 6, because:

The composition species represented by structure 1 in instant claim 6 are each distinct in their individual mechanisms of action, bioavailability factors, pharmacokinetics, etc.

The species are independent and distinct for instant claim 7, because:

The disease state species are independent and distinct for instant claim 7, because:

The disease state species of instant claim 7 are each distinct in etiology, susceptibilities, properties, mutagenicities, characteristics, etc.

The **nC+** species (a)-(gg) of the composition of instant claim 1 and species of the disease state species (a)-(w), respectively are distinct via design, operation, and/or effect such that a comprehensive search of the patent and non-patent literature for any one said composition species and/or disease state species would not readily result in a comprehensive search of any one other and/or more of the other compositions and/or disease state species recited in the claims. Despite anything to the contrary, Applicant may have established an underlying common function to this broad genus of compositions, namely, that they are capable or amenable for enhancing oxygen delivery to a tissue or organ of a mammal, but it remains that the art does not necessarily recognize such a shared function as being common to each of the variety of distinct compositions encompassed by claim 6. Furthermore, the disparate nature and variability encompassed by this broad genus of composition precludes a quality examination on the merits

not only because a burdensome search would be required for the entire scope of the claim(s), but also because consideration of the findings of such a search for compliance with the statutes and requirements set forth under 35 U.S.C. 101, 102, 103 and 112 would be unduly burdensome. In addition, the discovery of any one of the presently claimed agents for use in a composition would not necessarily anticipate or reasonably suggest or render obvious the use of any one or more of the other compositions claimed for the same objective.

The species of disease states (claim 7) are etiologically and pathophysiologically distinct. The treatment protocol (i.e., duration of treatment, dosage amounts of pharmaceutical agents to be administered, frequency of treatment, etc.) and patient population such that a comprehensive search of the patent and non-patent literature for any one such disorder or condition would not necessarily result in a comprehensive search of any one or more of the other disorders or conditions recited in the present claims. It remains that the art does not necessarily recognize a shared characteristic as being common to each of the disparate disorders encompassed by the claims. For these reasons, they are, therefore, considered patentably distinct. It is noted that the discovery of the treatment of any one of the presently claimed disorders or conditions using a composition of the type presently claimed would not necessarily anticipate, reasonably suggest or render obvious the treatment of any one or more of the other disorders or conditions of the present claims for the same reasons described above.

Election of species should be made consistent with the following instructions:

(i) Election of inventions I and II require the election of (a) one, single disclosed species of **nC+** comprised in a composition represented by structure 1:

Ex. nC+ represents (a) nona-cyclohexylammonium-tri-sodium

(ii) Election of inventions I and II require the election of a single disclosed species of (a) **one, specific and exact disease state** from the list of instant claim 7.

Ex. disease state: **anemia**

Applicant is cautioned that the election of species, wherein the elected combination of agents is not adequately supported by the accompanying specification, may raise an issue of new matter under the written description requirement of 35 U.S.C. 112, first paragraph.

Applicant is also reminded that a proper reply to this election will include the identification of the exact page and line number that supports the elected specie(s).

Currently, claims 6-9 are generic.

Applicant is advised that a reply to this requirement must include an identification of the species of agents that are elected consonant with this requirement and a listing of all claims readable thereon the elected species of agents, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered nonresponsive unless accompanied by an election.

Upon the allowance of a generic claim, Applicant will be entitled to consideration of claims to additional species which depend from or otherwise require all the limitations of an allowable generic claim as provided by 37 CFR 1.141. If claims are added after the election, Applicant must indicate which are readable upon the elected species. Please reference MPEP §809.02(a).

Applicant is advised that the reply to this requirement to be complete must include (i) an election of a species or invention to be examined even though this requirement be traversed (37 C.F.R. 1.143) and (ii) an identification of the claims encompassing the elected invention.

The election of an invention or species may be made with or without traverse. To reserve a right to petition, the election must be made with traverse. If the reply does not distinctly and specifically point out supposed errors in the restriction requirement, the election shall be treated as an election without traverse.

Should Applicant traverse on the ground that the inventions or species are not patentably distinct, Applicant should submit evidence or identify such evidence now of record showing the inventions or species to be obvious variants or clearly admit on the record that this is the case. In either instance, if the Examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Timothy E. Betton whose telephone number is (571) 272-9922. The examiner can normally be reached on Monday-Friday 8:30a - 5:00p.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ardin H. Marschel can be reached on (571) 272-0718. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Ardin H Marschel 11/10/07

ARDIN H. MARSCHEL
SUPERVISORY PATENT EXAMINER

TEB